

Comparative Outcomes of Human Acellular Dermis (HADM) and Submuscular Tissue Expander Breast Reconstruction: A Meta-Analysis

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Abstract Text:

Background: Human acellular dermis (HADM) has become an increasingly utilized adjunct to traditional submuscular tissue expander-implant breast reconstruction. While numerous studies exist for both cohorts, there has not been a strong consensus regarding complication outcomes. This study evaluated the recent literature and stratified outcomes based on a meta-analysis of common post-operative complications; specifically, seroma, infection, flap necrosis, hematoma, and reconstructive failure.

Methods: A Pubmed query and manual search of the MEDLINE database for English-language articles on HADM and submuscular tissue expander breast reconstruction published from January of 2000 to February of 2011 yielded 901 citations. Two levels of screening identified 48 relevant studies. The Mantel-Haenszel fixed-effects and Der Simonian and Laird random-effects models were used to perform the meta-analysis.

Results: Nineteen studies reporting HADM (n=2,037) and 35 studies reporting submuscular outcomes (n=12,874) were used to estimate pooled complication rates. Pooled complication rates (all heterogeneity values $p < 0.01$) were generally higher in HADM patients than submuscular patients: total complications (15.4% vs 13.7%), seroma (4.8% vs 3.1%), infection (5.3% vs 4.6%), and flap necrosis (6.9% vs 4.9%). Furthermore, six studies reporting both HADM and submuscular outcomes were used to estimate relative risks of complications and confidence intervals. There was an increase in risk of total complications (relative risk, 2.05; 95 percent CI, 1.55 to 2.70), seroma (relative risk, 2.73; 95 percent CI, 1.67 to 4.46), infection (relative risk, 2.47; 95 percent CI, 1.71 to 3.57), and reconstructive failure (relative risk, 2.80; 95 percent CI, 1.76 to 4.45) in HADM patients compared with submuscular patients. There was a trend towards increased risk for hematoma (relative risk, 2.06; 95 percent CI, 0.86 to 4.94) and flap necrosis (relative risk, 1.56; 95 percent CI, 0.85 to 2.85), but the results were not statistically significant.

Conclusion: This meta-analysis suggests that the use of HADM increases complication rates vis-à-vis submuscular expander-implant reconstruction. This must be weighed against the potential advantages of HADM in enhancing cosmesis and ameliorating contracture.

Total Complications in HADM and Submuscular Reconstruction

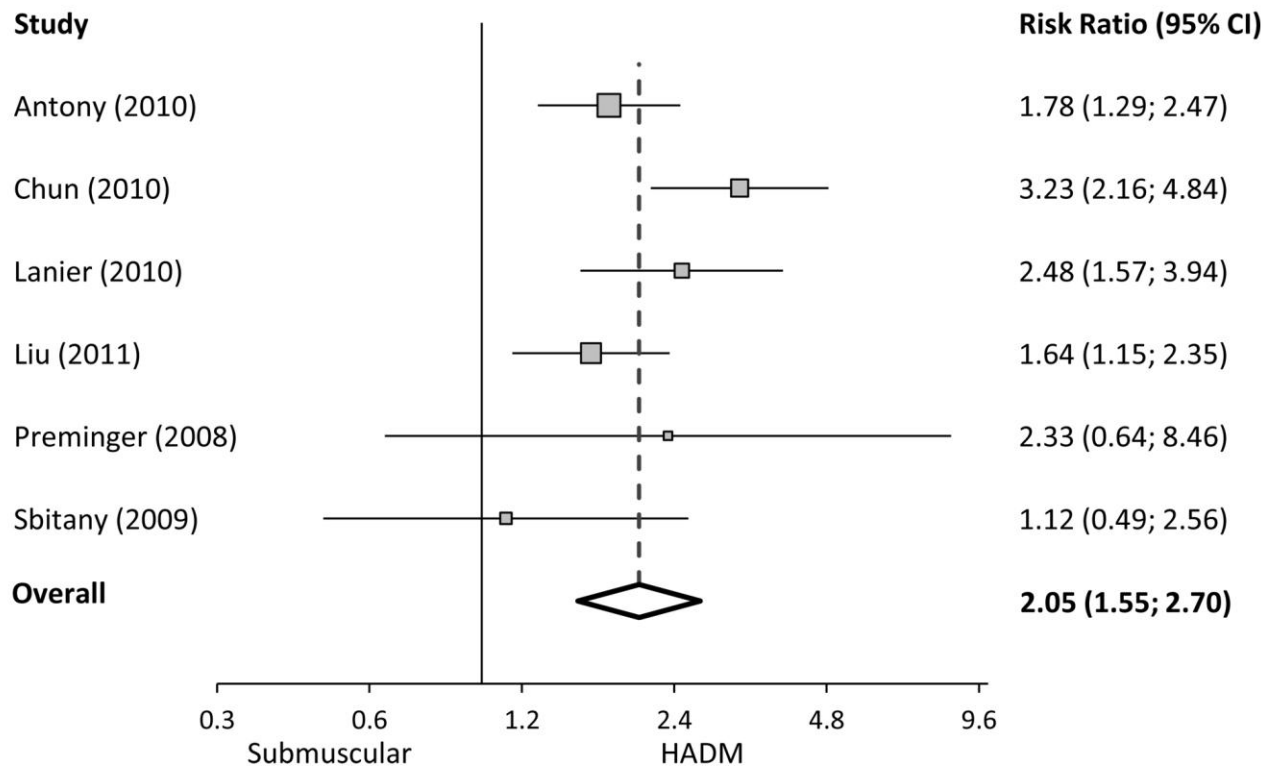


Figure 1. Total complications in HADM and submuscular patients. Size of the solid squares is inversely proportional to the variance of the study estimate. The diamond represents the random-effects relative risk and 95% confidence interval. The dashed line represents the overall estimate.